Resit exam for

DT503G Datorkommunikation och nätverk för civilingenjörer

August 26th, 2020

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Zoom (for questions)**:**
Zoom link: **https://oru-se.zoom.us/j/4207485391**
Zoom phone: +46 850 539 728 (meeting ID: 420 748 5391)

Exam details:
Total number of exercises: 9
Total number of points: 100
Exam time: 14:15 to 18:15 (4 hours)

Wiseflow **closes at 18:15:00**, that means it will not be possible to submit from 18:15:00.

Grading:
U corresponds to **less than 50** points
3 corresponds to **50** to 69 points
4 corresponds to **70** to 84 points
5 corresponds to **85** or more points

This is a **resit exam** therefore **no extra points** are given for the workshops.

Instructions:

- Each question indicates the points awarded when the **answer is fully correct**. **Write explanations** of how you thought. Even a wrong answer can give you points if you show that your thoughts were right. Please, use **short and complete sentences**.
- If a question or exercise looks unclear to you, then **make reasonable assumptions** and write them down.
- All exercises must be solved **individually**, no group work allowed.
- The only allowed materials are the course **book**, the **slides**, and the **material on Blackboard**.
- Write your solution using the word-processor of your choice, **save it in PDF format** and upload the PDF. You can also write your solution on paper (with clear handwriting), **scan it in PDF** format and upload the PDF. In this last case, if the writing is not legible we may skip the assessment of the unreadable responses.
- Please, answer **in English**, we do not evaluate your level of English.
- Any sign indicating that you have breached the above rules may lead to a case being **reported to the disciplinary office**.
- The **instructors are available** for clarifications from 15:15 to 16:15 on **Zoom**:
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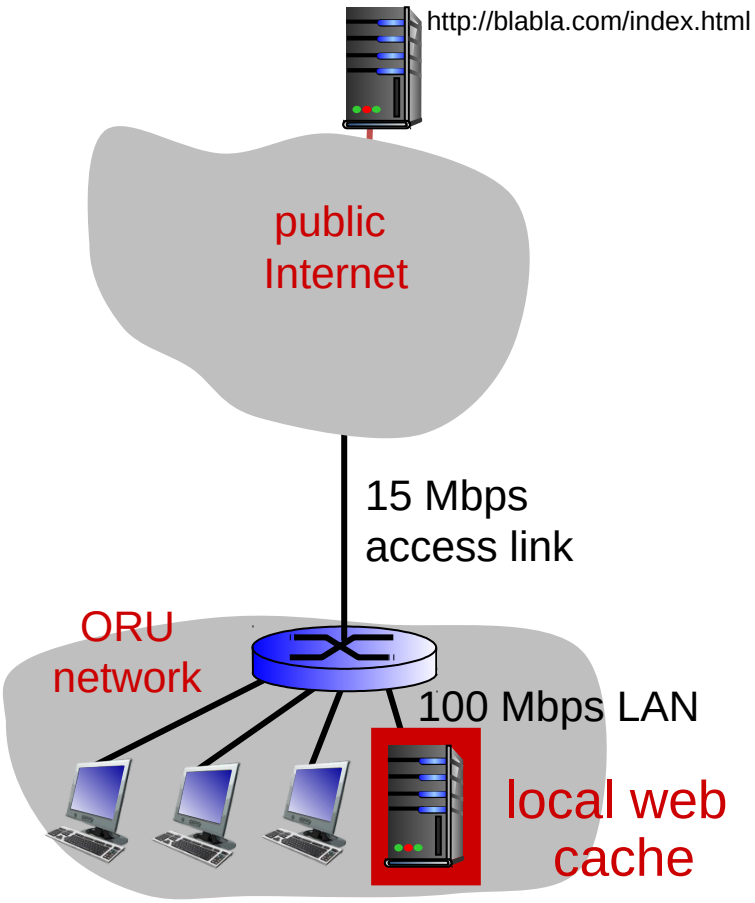
Question 1 - 10 pts

In the following example, explain how the local web cache at the university of Örebro (shown in the figure) can help to speed-up the access to the following webpage:

`http://blabla.com/index.html`

to students connected to the ORU network. What happens when the contents of the webpage `index.html` is updated in its server (`blabla.com`) with new information?



Question 2 - 5 pts

Explain the following HTTP message received by a client host:

```
HTTP/1.1 400 Bad Request
Date: Tue, 05 May 2020 13:05:50 GMT
Server: Apache/2.4.6
Connection: close
Content-Type: text/html
```

Question 3 - 12 pts

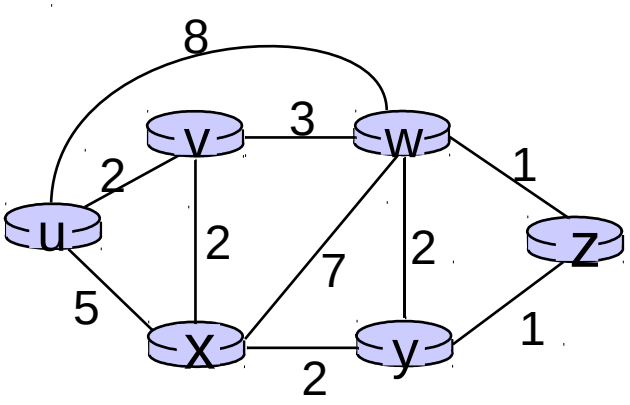
a) Sketch a network that contains at least 5 subnets (draw routers as circles with crosses inside and hosts as rectangles). Mark or describe between which entities the subnets can be found.

b) Assign IP addresses to each of the interfaces. Note that you can choose arbitrary IP addresses, however, they need to be appropriate (respecting subnet addressing rules).

Question 4 - 18 pts

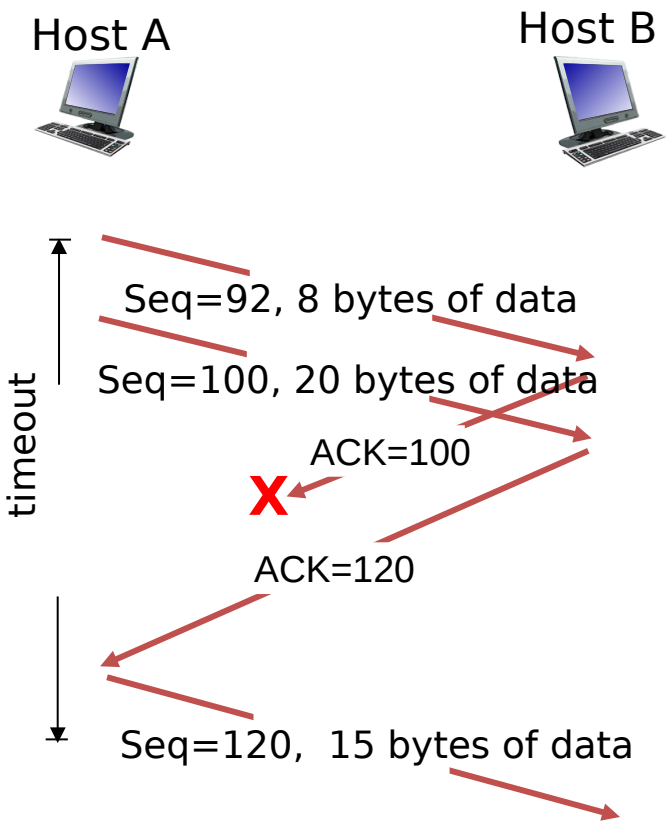
Calculate the forwarding table for node **u** using Dijstra algorithm. Indicate the steps following this table:

Step	N'	D(v), p(v)	D(w), p(w)	D(x), p(x)	D(y), p(y)	D(z), p(z)
0	u					



Question 5 - 10 pts

In the TCP protocol situation showed in the figure. Explain the reason why host A does not need to re-send packet with seq=100 even when the corresponding ACK=100 is lost.



Question 6 - 10 pts

Explain the difference between the "polling" and the "token passing" MAC protocols.

Question 7 - 15 pts

Answer the following questions concerning cryptography.

a) What is cryptography used for?

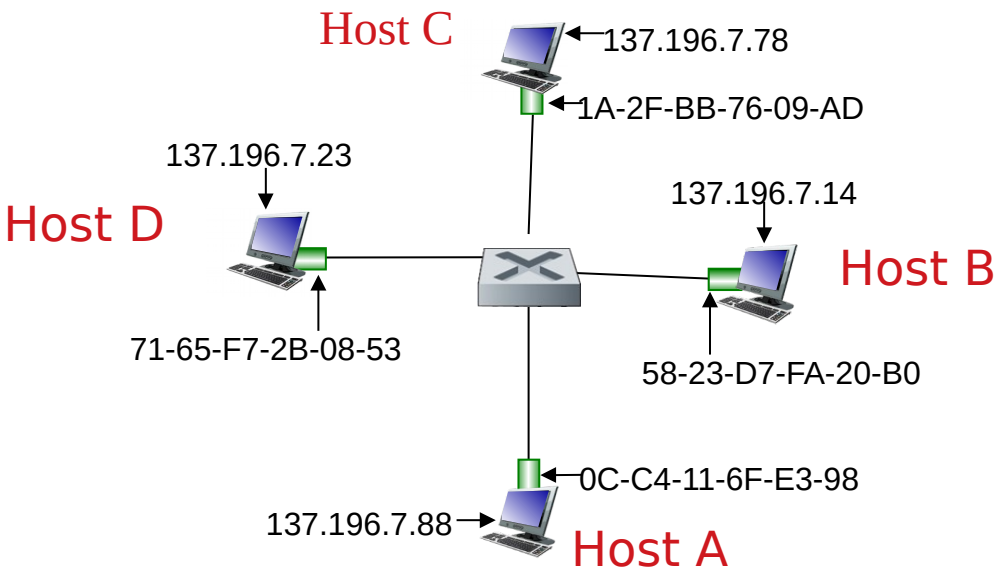
b) What are the two different types of cryptography?

c) What is the advantage with the one type of cryptography and what is the advantage with the other type of cryptography (see b))?

d) Alice wants to securely send a message m to Bob. How can she combine the advantages of one type of cryptography with the other type of cryptography (see c))?

Question 8 - 10 pts

Write the ARP table for the switch in the following subnet:



Question 9 - 10 pts

Explain what is the main service provided by DNS servers and give an example.